



A2Z Corp
3955 S Mariposa St
Englewood CO 80110
P 720 833-9300
F 720 385-2118

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A2Z CNC upgrades for Sherline mills explained

For upgrading a Sherline mill we really have 2 different types of upgrades, plus one that is both types combined together.

First is extended travel upgrades that will give you a larger working envelope, but use the same type of screw as Sherline uses on the stock machine. Examples would be the 14" travel X table and the 11" travel Y base.

Second are accuracy/performance upgrades that will replace the screws with precision leadscrews and anti-lash nuts from Haydon Kerk. This would be the precision leadscrew upgrade.

The combination of extended travel and accuracy/performance upgrades combined would be the Z column. It increases the travel, but is only available in combination with a precision leadscrew.

Regarding what parts to purchase, following is an explanation of how it all works and what part numbers to order.

X Table:

There is only a single version of the X table. What the different part numbers specify is what type/thread the leadscrew is or if there is no leadscrew included.

XTTS2 - is the X table with a 1/4-20 (stock style) screw in the required longer length.

XTTS2M - is the same X table but with a metric 1mm pitch (stock style) screw in the required longer length.

XTTS2G - is again the same X table, but with NO screw. This is intended if you are doing the PLSS Precision leadscrews at the same time. It saves you the cost of the stock style screw that you do not need if you are going to our precision lead screws upgrade.

The X table is drilled and tapped to accept both the one 5-40 screw which attaches the factory manual leadscrew thrust collar as well as with two 8-32 holes to accept the Sherline factory or A2Z CNC motor mounts or the A2Z Ball Bearing Thrust Collar.



Y Base:

There is only a single version of the Y base. What the different part numbers specify is what type/thread the leadscrew is or if there is no leadscrew included.

XTBS1 - is the Y base with a 1/4-20 (stock style) screw in the required longer length.
XTBS1 M - is the same Y base but with a metric 1mm pitch (stock style) screw in the required longer length.

XTBS1 G - is again the same Y base, but with NO screw. This is intended if you are doing the PLSS Precision leadscrews at the same time. It saves you the cost of the stock style screw that you do not need if you are going to our precision lead screws upgrade.

If upgrading to our extended Y base you will need additional headstock spacers to take advantage of the added travel. We offer our 2.2" version as HSR51.

The Y Base is drilled and tapped to accept both the one 5-40 screw which attaches the factory manual leadscrew thrust collar as well as with two 8-32 holes to accept the Sherline factory or A2Z CNC motor mounts or the A2Z Ball Bearing Thrust Collar.

Z Column:

There are 2 versions of the Z column. The difference is whether it comes with a mounting plate to accept a Sherline headstock or a Taig headstock. You can buy the headstock mounting plate separately so if you ever want to convert it is just a change of one small part. All part numbers include the Haydon Kerk precision leadscrew and matching anti-lash nut. What the different part numbers specify is what thread pitch of the leadscrew is.

XTZS1-4TPI - Is the Z column for a Sherline headstock with a 4 tpi Teflon coated Haydon Kerk precision leadscrew and anti-lash nut.

XTZS1-20TPI - Is the Z column for a Sherline headstock with a 20 tpi Teflon coated Haydon Kerk precision leadscrew and anti-lash nut.

XTZS1-5mm - Is the Z column for a Sherline headstock with a 5 mm pitch Teflon coated Haydon Kerk precision leadscrew and anti-lash nut.

XTZS2-4TPI - Is the Z column for a Taig headstock with a 4 tpi Teflon coated Haydon Kerk precision leadscrew and anti-lash nut.

XTZS2-20TPI - Is the Z column for a Taig headstock with a 20 tpi Teflon coated Haydon Kerk precision leadscrew and anti-lash nut.

XTZS2-5mm - Is the Z column for a Taig headstock with a 5 mm pitch Teflon coated Haydon Kerk precision leadscrew and anti-lash nut.

The Z column is shipped with our horse shoe shaped mount adapter. This adapter mount to the two 8-32 holes on the column that are on the standard Sherline factory CNC mount spacing. The adapter has a set of two tapped 8-32 holes that are on the same spacing as the Sherline factory CNC motor mounts, the A2Z CNC motor mount for Sherline, and the A2Z Manual Ball Bearing Thrust Collar. The mount adapter serves to move the centerline for the motor/hand crank mechanism from the original position for use with a factory Sherline 1/4" diameter screw to the new centerline required for the 7/16" Haydon Kerk precision leadscrews.



Precision Leadscrew Upgrade:

This item does not include any parts to change the travel on your machine. Extended X table and/or Y base needs to be ordered separately. If ordering the Precision leadscrew upgrade at the same time as the X table and Y base you would order the no screw version of the table and base to save some \$\$ as the screws will be in the precision kit.

Here is what you get when you order the precision leadscrew upgrade.

XY Saddle that is sized for the larger Haydon Kerk Precision screws.

Two Haydon Kerk 7000 series precision leadscrews with Kerkote treatment.

Two Haydon Kerk NTBF anti-lash self compensation nuts.

Two Mount Adapters to reposition your CNC motor mounts or A2Z Ball

Bearing Thrust Collars to the new position for the larger screws.

As far as deciphering the part numbers go, it is actually straight forward. The part after the dash is pretty self explanatory. It is the thread pitch of the precision leadscrew that is installed on the column. The first part of the part number is PLSS for Precision Lead Screw Sherline. Then there is a number. The number after PLSS and before the dash indicates what length screws you will receive and depends on whether the mill is a 5400 or a 2000 (or the corresponding metric machine number 5410 or 2010), and if any of the axes have been upgrade to extended travel parts.

Following is the breakdown:

PLSS1 - For a mill that has A2Z extended X table and extended Y base.

PLSS2 - For a mill with a stock X table and an A2Z extended Y base.

PLSS3 - For a 2000/2010 mill with an A2Z extended X table and the stock base.

PLSS4 - For a 5400/5410 mill with an A2Z extended X table and the stock base.

PLSS5 - For a 2000/2010 mill with a stock X table and the stock base.

PLSS6 - For a 5400/5410 mill with a stock X table and the stock base.

Put a dash after the above numbers and add 4TPI, 20TPI, or 5MM and you have the whole part number.

For most CNC applications with the Haydon Kerk precision leadscrews, we recommend the 4 tpi or 5mm/turn (pitch) set as it will vastly improve the performance of your steppers compared to a 20 tpi screw. The theoretical accuracy is lower on the coarser thread screws, but in the real world it is unnoticeable in regard to accuracy, but very noticeable in all other performance areas. We only recommend the 20 tpi version for manual applications and if you are running low torque servos like offered by IMService. They are better at spinning fast than steppers and don't handle a torque load as well as steppers.



CNC Motor Mount

The A2Z CNC Motor Mount for Sherline machines is directly interchangeable with the Sherline factory item 67102. The A2Z version uses the two 8-32 mounting holes as used by the factory version. It also uses the same flanged bearings (Sherline 67120) and CNC motor coupler (Sherline 67105). The advantage of the A2Z version besides lower cost is that you can easily reposition your motors for the best cable routing. On the factory mounts, you have to remove the screws that hold the motor to rotate the motor alignment. On the A2Z version, you just loosen the screws and turn the motor to where you want it.

Versions available:

CNCMMS – This is the version that includes the motor mount body, flange, 2 - 67120 flanged bearings and mounting hardware.

CNCMMS-B – This is the same as the CNCMMS except that it does NOT include the 2 - 67120 flanged bearings that are required. If you are upgrading from our Manual Ball Bearing Thrust Collar for Sherline or factory Sherline CNC motor mounts, you can use the 67120 bearing that comes with them in this version of the motor mount and save purchasing extra bearings.

Both version of the A2Z CNC Motor Mount for Sherline require the 67105 CNC motor coupler that is NOT included with either item. We offer the coupler separately as a factory Sherline part that we stock in inventory.

